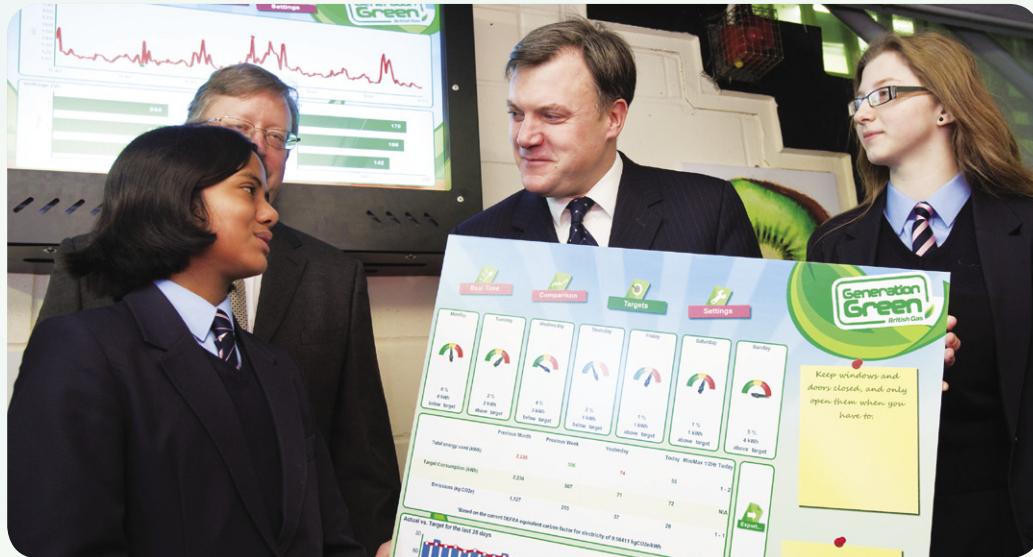


Energy Display Meter User Guide



Engage, educate and inspire smart energy usage

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Energy Display Meter managed by

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Introducing your new Energy Display Meter

This user guide is designed to provide you with all you need to know about the new Energy Display Meter equipment and the software that has been installed on a PC in your school.

You will also find information on how to access and use the Meter's energy data to engage, educate and inspire your pupils to be smart about their energy usage.

Use the interactive buttons at the bottom of each page to navigate through the user guide.

What does this user guide contain?

Technical information:

- ★ What equipment has been installed?
- ★ How does it work and provide information?
- ★ What does the PC dashboard show?

Encouraging smart energy usage:

- ★ How can the Energy Display Meter help us better control our energy usage?
- ★ Where can we find more information on energy management?
- ★ FAQs

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Technical information

What equipment has been installed?

Your school has been provided with a free Energy Display Meter, which consists of a Sub-Meter, Current Transformers (CTs), a Data Logger and a PC dashboard display. These components collect and store real time and half-hourly electricity consumption data from the main electricity supply, and displays it on a PC dashboard.

A more detailed specification of the equipment can be found in the appendices of this guide.



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How does it work and provide information?

The Current Transformers (CTs)

The CTs are placed over the cables of the main electrical supply. Each CT communicates with the sub-meter and tells it how much current is passing through the supply cables.

The cables produce a magnetic force when electricity passes through them. The CTs measure the changes in this magnetic force and use this to work out how much electricity is passing through the cable.



The Sub-Meter

Using the small changes in magnetic force coming from the CTs, the meter can determine how electricity is being used by the school. The sub meter measures:

- ★ The voltage in Volts (V).
- ★ The current in Amps (A), or the amount of electrons passing through the power cables.
- ★ The Power in Kilowatts (kW).



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The Data Logger

The Sub-Meter communicates the information it gathers to the Data Logger. This constantly requests the data from the meter and passes this information to the PC dashboard.

The data from the Sub-Meter includes a measure of the Voltage, Current and Power. The information the Data Logger gathers is also stored for up to three months so the PC dashboard can represent current real time data and historical consumption for the three months. Energy consumption data can be exported to a convenient format (such as a spreadsheet) for long term records and further analysis.



Don't forget

Use the PC dashboard to save your school's data at least once every term.

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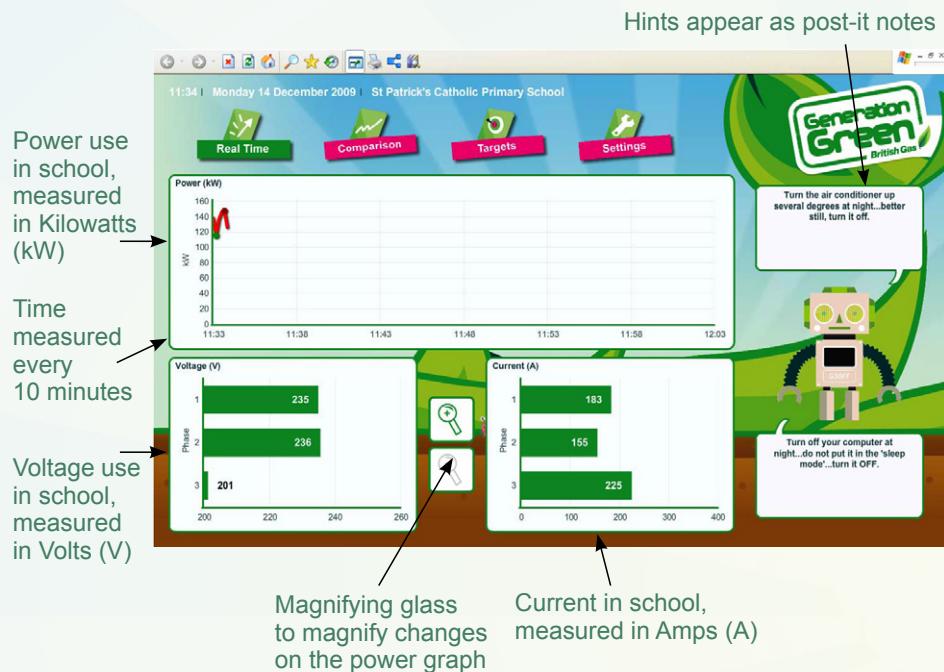
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What does the PC dashboard show?

The Energy Display Meter hardware generate a series of dashboards that you can display on up to 5 networked PCs. The PC dashboard helps you make sense of the data and use it to observe patterns, analyse data, and reduce your energy consumption.



Real Time screen

The Real Time part of the dashboard updates every ten seconds, showing you detailed information on the school's electricity usage in real time.

Real Time measurements are available for:

- ★ **Voltage** – Measured in Volts (V) this tells you how much force is being used to 'push' the electricity around your school.
- ★ **Current** – Measured in Amps (A) this tells you how much electricity is needed in your school.
- ★ **Power** – Measured in Kilowatts (kW) this is calculated by multiplying the Voltage and Current together. It tells you how much Power is being used by your school.

Don't forget

The Real Time screen allows you to apply science and mathematics to the data. You can see how electricity is being used in your school by collecting the data and analysing patterns.

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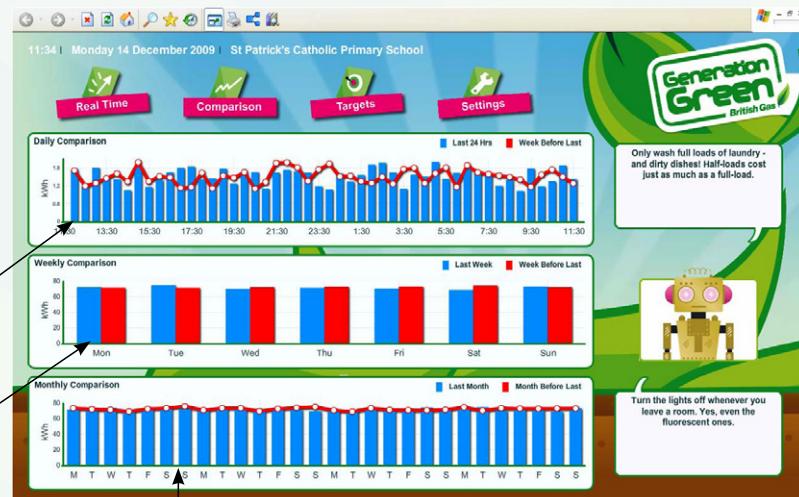
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Comparisons screen

The Comparisons section of the dashboard shows you the data over differing periods of time.



Day by Day
Comparison showing last 24 hours of power use, compared to last week

Week by Week
Comparison showing last week of power use, compared to the week previous

Month by Month

Comparison showing last month of power use, compared to the month previous – each month is 28 days

Comparison graphs:

Day by Day

– This shows you today's usage and compares it to the same day last week.

Week by Week

– This shows you the whole of last week's usage and compares it to the week before that.

Month by Month

– This shows you the last 28 days' usage and compares it to the 28 days before that.

This screen allows you to analyse your school's efficiency. Every day's energy usage is different; seeing where the differences are and learning why they happen gives you the information you need to improve. Historic comparisons of data are measured in Kilowatt hours (kWh).

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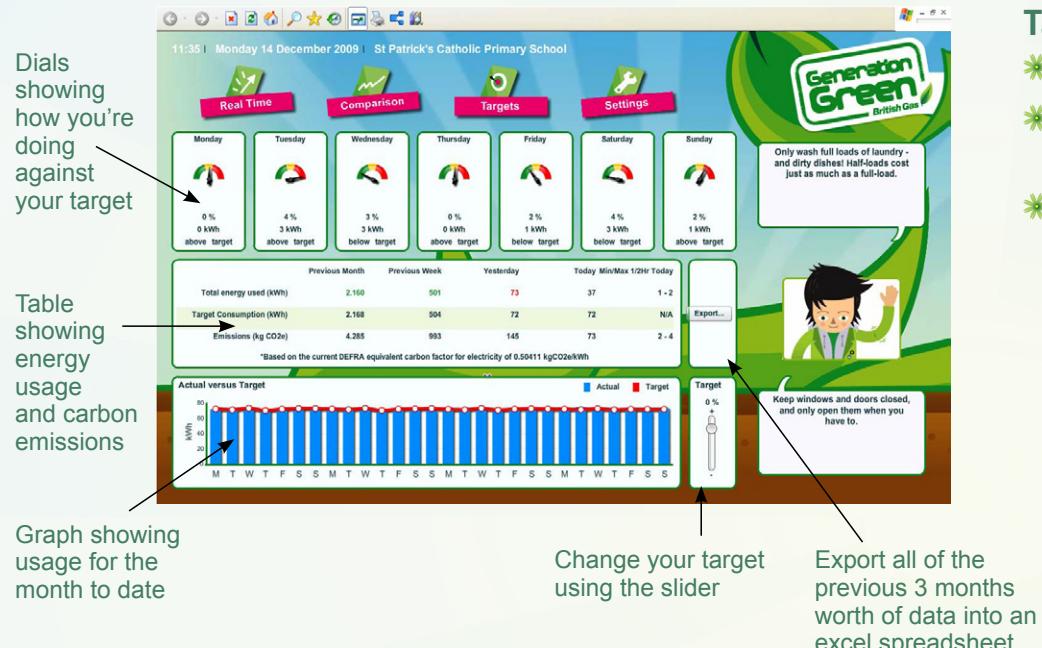


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Targets screen

Once you have analysed your school's efficiency, you can then set targets. This screen allows you to set targets and measure whether or not you have met those targets.

By using the target slider, you can increase or decrease your target level.



Target tracking tools:

- * **Dials** – This visually demonstrates the state of your current target.
- * **Table** – This shows you how much energy you have used and your carbon emissions.
- * **Graph** – This illustrates your usage for the month to date. It then uses averaging to work out how your energy usage may look for the rest of the month.

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Settings screen

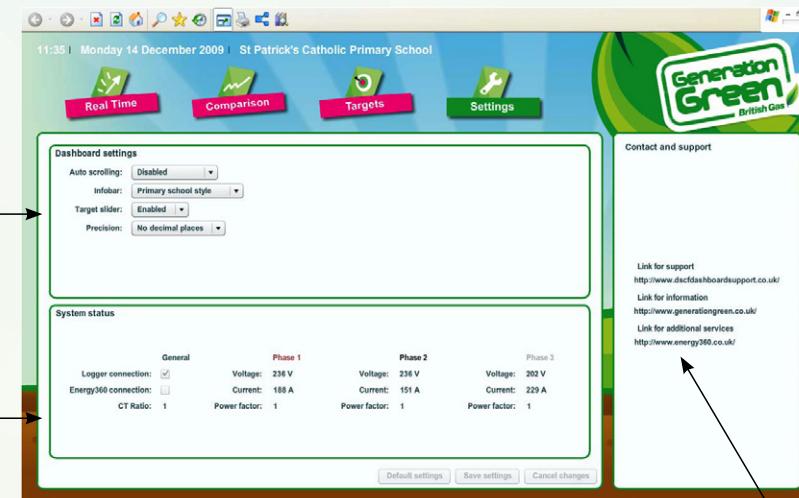
This screen allows you to control your dashboard settings, review the status of your system, and view contact and support details for your meter.

Dashboard Settings Area

This is where you can change between primary and secondary dashboard and manage the scrolling of screens

System Status Area

This is technical data area and confirmation of logger connection



Contact and support
information for
your meter

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Encouraging smart energy usage

How can the Energy Display Meter help us better control our energy usage?

Teaching resources for Key Stages 2 to 4 have been created to accompany your Energy Display Meter, and are available to download free from www.generationgreen.co.uk. These science and math-based resources introduce pupils to the Energy Display Meter and its purpose and significance in the quest to cut CO₂ emissions, and challenge pupils to discover the answers to questions such as:

- ★ How can we reduce energy wastage in school?
- ★ How can we reduce our carbon footprint?

Quick-start activity:

Switch off session

The main benefit of the Real Time screen is that when you turn off things that consume electricity, like the lights in your classroom, you will see a change in the Power and the Current levels. In some cases, where the whole school is using a lot of power in total, the change may be very small, but the effect will still be seen.

Get your pupils to think of everything in the school that uses electricity and write them down in a list. Then try to work out when they are turned on and off. Your pupils will see a change in the school's electricity usage levels on the PC dashboard.

Using the Real Time section of the PC dashboard, you can see the benefits of turning devices off when they are not in use. Then, by using the tables and graphs in the Comparisons section, you can see how much energy your school has saved.



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Where can we find more information on energy management?

Generation Green www.generationgreen.co.uk

A nationwide learning programme from British Gas, bringing together communities through schools to create a greener future. The website contains fun curricula linked activities, lessons and ideas to encourage sustainability, engage pupils in environmental issues and reward your school with great green giveaways.

The Carbon Detectives Kit www.carbondetectives.org.uk/content/home/getinvolved/findout

A fun online tool to help pupils calculate their school's carbon footprint and learn how it could be reduced.

Eco-schools www.eco-schools.org.uk

An international programme for management and sustainable development education for schools. Eco-schools provides a student-centred approach that combines learning with action – and schools can progress from the bronze award to the prestigious green flag award.

10:10 www.1010uk.org

A national 10:10 campaign which challenges individuals, businesses and organisations (including schools), to pledge to cut their emissions by 10%. Help will be provided throughout 2010 to implement these pledges.

Sustainable Schools www.teachernet.gov.uk/sustainableschools

Practical sustainable teaching resources, guidance and inspiration for schools.

Sustainability Matters www.teachernet.gov.uk/sustainableschools/about/about_detail.cfm?id=127&levelselected=1

This film has been produced by Sustainable Schools to inspire and stimulate debate in schools. It is designed to be downloaded and shown in lessons and meetings focusing on sustainability.



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The Department of Energy and Climate Change

<http://www.decc.gov.uk> The relatively new Department of Energy and Climate Change (DECC) was set up to reflect the fact that climate change and energy policies are inextricably linked. Decisions made in one of these areas will effect the other.

Act on CO₂ <http://actonco2.direct.gov.uk> Act on CO₂ aims to help people save money, save energy and reduce their CO₂ emissions. The campaign highlights how individuals can act to make a difference.

We Are What We Do www.wearewhatwedo.org

A new kind of movement which aims to inspire people to change the world one small action at a time. With over 100 simple actions in their new Schools Toolkit, you can start tracking, making and campaigning to get your school involved right now.

2041 www.2041.com/antarctic-expeditions/e-base
2041 was founded by polar explorer and environmental leader Robert Swan, OBE, the first person in history to walk to both the North and South poles. As UN Goodwill Ambassador for Youth, he has set up the first educational base (E-base) in Antarctica to serve as a resource for teachers and an inspiration to young people around the world on sustainable living.

United Nations Conference on Climate Change in Copenhagen

www.actoncopenhagen.decc.gov.uk/en
www.actoncopenhagen.decc.gov.uk/en/ukaction/youth

In December 2009, Copenhagen hosted a major United Nations conference on Climate Change policies.

Extreme Ice Loss www.ted.com/talks/lang/eng/james_balog_time_lapse_proof_of_extreme_ice_loss.html This 20 minute video highlights climate change very effectively through time-lapse photography.

Action On Climate Change www.youtube.com/watch?v=zORv8wwiadQ www.youtube.com/watch?v=mF_anaVcCXg These videos on YouTube make a convincing argument in favour of taking immediate action on climate change.

National Energy Foundation www.nef.org.uk/greenschool/index.htm The National Energy Foundation has been set up to help combat climate change by assisting people and businesses throughout the UK to reduce their carbon emissions through the use of energy efficiency measures and renewable energy sources.

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mysusthouse www.mysusthouse.org An exciting interactive game which explains what sustainability means and how it relates to our homes. It provides a resource for meaningful and effective learning, and teaching opportunities relating to sustainable development.

The Carbon Trust www.carbontrust.co.uk/default.ct
The Carbon Trust's mission is to accelerate the move to a low carbon economy, by working with organisations to reduce carbon emissions now and develop commercial low carbon technologies for the future. The Carbon Trust, in partnership with the government and Salix Finance, can help public sector organisations access some of the £51.5 million in interest free funding available to help take advantage of energy efficiency technology.

Project Genie www.projectgenie.org.uk Project Genie's mission is to provide materials for teachers to empower children to achieve rapid, meaningful and sustained reductions in greenhouse gas emissions

CABE Green Day www.cabe.org.uk/publications/green-day

A one-day event for schools about climate change, sustainability and the environment. It is a fun and flexible way to integrate these themes into lessons and whole-school activities.

Team Green Britain www.teamgreenbritain.org/home

On the run up to the 2012 Olympic games, Team Green Britain aims to get us all living a more sustainable life. If we work together, we can leave a lasting, green legacy after The London 2012 Olympic and Paralympic Games.

Ashden Awards www.ashdenawards.org The Ashden Awards recognise excellence in local, sustainable energy solutions, from the UK and around the world. Since 2001 the scheme has helped more than 100 projects develop this work.

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FAQS

Q What is the purpose of the Energy Display Meter?

A The purpose of the Energy Display Meter is to provide real-time information about your school's electricity use in an easy-to-understand format which can be used as a teaching and learning tool. The project is being funded by the Department for Children, Schools and Families (DCSF) following the interim recommendations of the Zero Carbon Task Force on how all schools could reduce energy consumption and promote a culture of energy awareness. The programme is being managed by Partnerships for Schools (PfS) and delivered by British Gas. PfS is responsible for the management and delivery of the government's schools capital programmes.

Q What does the Energy Display meter measure?

A Your meter measures: current in Amps (A), or the flow of electrons in your school; voltage in Volts (V), or the pressure that is being used to push these electrons around the school; Power in Kilowatts (kW), which is the multiplication of voltage and current; and Kilowatt Hours (kWh) which is Kilowatts multiplied by time in hours. This is the most commonly known as the billing unit for electricity.

Q Does the meter affect my current electricity supply or electricity supply meter?

A No, the Energy Display Meter will not affect your normal meter or energy supply. The installation is completely independent of your main electricity supply meter, and therefore will be unaffected if you change your energy supplier in the future.

Q Is this a smart meter?

A No - whilst your Energy Display meter provides real time electricity information, it does not remotely communicate with your energy supplier. Smart meters for schools will be available in the coming years.

Q What are the requirements for the school computers or IT network?

A The school should provide a network point within 2 metres of the main distribution board, which our installation teams will connect the new meter to. Individual PCs onto which we install software will need to be running Windows XP or above

FAQS

Q Does the meter provide information about other energy usage (gas, fossil fuels etc)?

A Although the Energy Display Meter that British Gas is installing in your school does have the capability to measure other forms of energy, the dashboard which your school will see will only monitor electricity usage at this time.

Q Who can I contact if I want to find out any more information?

A The website www.teachernet.gov.uk/energydisplaymeter is the primary source of information relating to your meter. Alternatively you will find contact details on the back cover of this guide.

More FAQs can be found on the website at
www.teachernet.gov.uk/energydisplaymeter

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Equipment Specifications

Sub-Meter	Current Transformer	Data Logger GS-Z3
Multifunction Class 1 kWh Meter <ul style="list-style-type: none"> Auto correction for easy installation and commissioning Pulsed output Phase indication UK manufacture Clear display for Volts, Amps, pf, kWh, kVAh and frequency 	Split core Current Transformer <ul style="list-style-type: none"> Special output for additional safety (open circuit) No tools required to fit Pre-wired construction for easy installation 	Data Logger GS-Z3  <p>High performance Data Logger and metering interface. The GS-Z3 is a complete sub metering concentrator and allows many meters to be added to extend the energy management capabilities. The GS-Z3 utilises standard IT functionality and is a plug and play energy management system</p> <ul style="list-style-type: none"> Compliant with the latest version of BECTA's Institutional Infrastructure Technical Specification TCP/IP enabled, DHCP or Static IP Onboard encryption Upgradeable and programmable Compatible with Energy360 aM&T 2 pulsed inputs (dry contacts) Up to 20 additional Sub-Meters can be connected without any hardware upgrade Concurrent access (up to 5 simultaneous connections) 'Real Time' data pass through for instantaneous Voltage and Current data Stores up to 3 months of half hourly kWh interval data 
Dimensions 96 x 96 mm x 83.5 mm (72 mm behind panel)	Standard Ratings Split core Class 1	
Accuracy 150A 400A 800A	Accuracy 150A 400A 800A	
Standards EN 61010-1 Installation Category III		
Technical Specifications Voltage – 230/400V Current – As CTs		
Outputs Modbus Serial Comms Pulsed output		

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Contact Information:

For queries relating to your Energy Display Meter, please call **0845 6737 450** or email DCSFenquiries@britishgas.co.uk.

You can also write to us at:

DCSF Enquiries Team, British Gas Business, Cippenham Court,
Cippenham Lane, Slough, Berkshire, SL1 5AU.

Phone lines open Monday – Friday 8am-5pm.

British Gas Trading Limited

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